AMENDMENTS TO THE CLAIMS

1-46. (Cancelled)

47. (Currently Amended) A biochip assembly for a cell based assay comprising:

a plurality of biochips, each biochip comprising at least one elongate microchannel, an inlet port adjacent one end of each microchannel,

an outlet port adjacent the other end of each microchannel;

a liquid delivery unit having a plurality of liquid delivery ports, one for connection to each biochip;

a least one fluidically separate reservoir well for use with each biochip; and

releasable connection means for each port and well for reception of removable separate enclosed transfer conduits for releasable fluidic connection of some of the ports to other of the ports and wells,

such that bidirectional flow of liquid along each of the microchannels may take place.

48. (Previously Presented) A biochip assembly for a cell based assay comprising:

a plurality of biochips, each biochip comprising at least one elongate microchannel;

an inlet port adjacent one end of each microchannel and an outlet port adjacent the other end of each microchannel;

a liquid delivery unit having at least one liquid delivery port for connection to each biochip;

two sets of at least two fluidically separate reservoir wells, one adjacent the inlet port and the other adjacent the outlet port of each biochip; and

releasable connection means for each port and well for reception of removable separate enclosed transfer conduits for releasable fluidic connection of some of the ports to other of the ports and wells.

49. (Currently Amended) A biochip assembly for a cell based assay comprising:

a plurality of biochips, each biochip comprising at least one elongate microchannel,

an inlet port adjacent one end of each microchannel and an outlet port adjacent the other end of each microchannel;

a liquid delivery unit having a plurality of liquid delivery ports, one for connection to each biochip,

at least one fluidically separate reservoir well for use with each biochip; and

a plurality of removable separate enclosed transfer conduits for releasable fluidic connection of some of the ports to other of the ports and wells,

such that bidirectional flow of liquid along each of the microchannels may take place.

50. (Previously Presented) A biochip assembly as claimed in claim 49, in which each biochip has more than one inlet port, each of which is for connection to a different liquid delivery unit.

51. (Previously Presented) A biochip assembly as claimed in claim 49, in which each biochip has more than one outlet port.

52. (Previously Presented) A biochip assembly as claimed in claim 49, in which the biochip comprises a pair of elongate microchannels, each having at least one inlet port at its proximal end and at their distal ends connecting into a further microchannel having at least one outlet port at its distal end to form therewith a Y-shaped composite microchannel.

53. (Previously Presented) A biochip assembly as claimed in claim 49, in which the biochip comprises at least one elongate microchannel having a bore, at least one intermediate portion of which has a different cross-sectional area to that of the rest of the microchannel.

54. (Currently Amended) A biochip assembly as claimed in claim 49, in which each biochip comprises a pair of elongate microchannels each microchannel having at least one inlet port and at least one outlet port, the microchannels being connected at their proximal ends and distal ends respectively.

55. (Currently Amended) A biochip assembly for a cell based assay comprising:

a plurality of biochips, each biochip comprising at least one elongate microchannel, an inlet port adjacent one end of each microchannel and an outlet port adjacent the other end of each microchannel;

a liquid delivery unit having a liquid delivery port for connection to each biochip;

at least one fluidically separate reservoir well for use with each biochip; and

a plurality of removable separate enclosed transfer conduits for releasable fluidic connection of some of the ports to other of the ports and wells, each transfer conduit having an internal cross sectional area substantially greater than that of each microchannel, such that bidirectional flow of liquid along each of the microchannels may take place.

56-78. (Cancelled)

79. (Previously Presented) A method of conducting a biological cell assay on a cell based assay assembly as claimed in claim 49, comprising the steps of:

(a) connecting the liquid delivery outlet port to a well by a transfer conduit;

(b) aspirating liquid from the well into the transfer conduit;

(c) connecting the transfer conduit to an inlet port;

(d) delivering liquid from the transfer conduit through the biochip and then repeating steps (a) to (d) as often as required; and

(e) then carrying out the assay with the detection and recording equipment as the

final step (d) is being carried out.

80. (Previously Presented) A method as claimed in claim 79, in which the additional step, after one or more of step (d), is carried out of simultaneously using another transfer conduit to connect the outlet port of the biochip to another well.

81. (Previously Presented) A method as claimed in claim 79, in which the additional step is performed of filling the transfer conduit with the system liquid.

82. (Previously Presented) A method as claimed in claim 79, in which the additional step is performed of replacing the transfer conduit between aspirating liquids from wells during steps (a)-(d) in order to avoid cross-contamination.

83. (Previously Presented) A method as claimed in claim 79, in which, after aspirating liquid from a well, the additional step of flushing system liquid through the transfer conduit is carried out.

84. (Previously Presented) A method as claimed in claim 79, in which a desired flow rate (Q_1) within the biochip assembly is achieved by:

determining the required pressure (P_1) within the liquid delivery unit to achieve the desired flow rate (Q_1) by first determining a steady flow rate ($Q_{plunger}$) for the pump which

maintains a constant pressure (P) within the biochip assembly to provide a fluidic resistance factor (R_f) for each biochip determined by dividing the pressure (P) by the flow rate ($Q_{plunger}$) and then multiplying the desired flow rate (Q_1) by this fluidic resistance factor (R_f) to provide the required pressure (P_1); and

then operating the pump to provide the required pressure (P_1).

85. (Previously Presented) A method as claimed in claim 79, in which a desired flow rate (Q_1) within the biochip assembly is achieved by:

determining the required pressure (P_1) within the liquid delivery unit to achieve the desired flow rate (Q_1) by first determining a constant pressure (P) which maintains a steady flow rate ($Q_{plunger}$) for the pump within the biochip assembly to provide a fluidic resistance factor (R_f) for each biochip determined by dividing the pressure (P) by the flow rate ($Q_{plunger}$) and then multiplying the desired flow rate (Q_1) by this fluidic resistance factor (R_f) to provide the required pressure (P_1); and

then operating the pump to provide the required pressure (P_1).

86. (Previously Presented) A method as claimed in claim 84 or 85, in which when the pressure drops below the required pressure (P_1) by a predetermined amount, the pump is operated to deliver liquid into the liquid delivery unit and when the required pressure is exceeded by a predetermined amount, the pump is reversed to aspirate liquid.

87. (Previously Presented) A method as claimed in claim 84 or 85, in which the flow rate of the pump is varied to maintain the pressure within a predetermined range of pressure.

88. (Previously Presented) A method as claimed in claim 84 or 85, in which the required pressure (P_1) is achieved with the predetermined displacement volume (ΔV) of the pump over a predetermined time by varying the compressibility of the pressure compressible means.

89. (Previously Presented) A method as claimed in claim 88, in which the varying of the compressibility of the pressure compressible means comprises adding or reducing the amount of gas within the link body.

90. (New) A biochip assembly as claimed in claim 47, wherein the bidirectional flow of the liquid along each of the microchannels enables introduction and exchange of different liquids without the introduction of air bubbles.

91. (New) A biochip assembly as claimed in claim 48, wherein the bidirectional flow of the liquid along each of the microchannels enables introduction and exchange of different liquids without the introduction of air bubbles.

92. (New) A biochip assembly as claimed in claim 49, wherein the bidirectional flow of the liquid along each of the microchannels enables introduction and exchange of different liquids without the introduction of air bubbles.

93. (New) A biochip assembly as claimed in claim 55, wherein the bidirectional flow of the liquid along each of the microchannels enables introduction and exchange of different liquids without the introduction of air bubbles.